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PENSOFT

First record of *Coendou ichillus* (Voss & da Silva, 2001) (Rodentia, Erethizontidae) from Tambopata province in southeastern Peru

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Abstract. *Coendu ichillus* is a species of dwarf porcupine (Rodentia, Erethizontidae) found in the Neotropics. First described in 2001 from Ecuador and Iquitos, Peru, its known range has since been expanded to include the Amazonia of southern Ecuador, Peru, Colombia, and Brazil. Here I report a new distribution record of *C. ichillus* representing the first record from the province of Tambopata in the Madre de Dios region of southeastern Peru.

Keywords. Amazon, dwarf porcupine, Madre de Dios, Neotropics

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Introduction

Neotropical porcupines belong to the order Rodentia and to the family Erethizontidae. The genus *Coendou* Lacépède, 1799 currently consists of 16 known species (Menezes et al. 2021). Commonly known as tree porcupines or prehensile-tailed porcupines, *Coendou* species inhabit tropical and subtropical forests in South America and Mexico (Voss 2015). Four of these species are small-bodied or dwarf porcupines. They are in the *vestitus* group of the subgenus *Caaporamys* Menezes et al., 2021: *Coendou vestitus* Thomas, 1899, *Coendou pruinosus* Thomas, 1905, *Coendou roosmalenorum* Voss & da Silva, 2001, *C. ichillus* Voss & da Silva, 2001, and *Coendou melanurus* (Wagner, 1842). All species in *Coendou* have a dorsal pelage that consists of fur and quills. Small-bodied porcupines feature an additional quill type which is similar in structure to the standard quill but is more elongated and slimmer, described as "thin bristle-quills" by Voss (2001).

Coendou ichillus was first described in 2001 from a museum specimen collected in a lowland Amazon rainforest in eastern Ecuador in 1936. The species' name is derived from "ichilla" which means small in Quichua, the language spoken in the indigenous territory in Ecuador from where the species was first described (Voss and da Silva 2001). The full morphological description of *C. ichillus* can be found in Voss and da Silva (2001). Currently, *C. ichillus* is known from four countries: Ecuador (Voss and da Silva 2001), Peru (Voss and da Silva 2001; Voss 2011), Colombia (Ramírez-Chaves et al. 2015), and Brazil (Menezes et al. 2020). *Coendou ichillus* and *C. roosmalenorum* were the first records of small porcupines in the Western Amazon (Voss and da Silva 2001). At that time the only records of *C. ichillus* were from the lowland Amazon rainforest of eastern Ecuador and northern Peru. In an update to that paper, Voss (2011) reported another record of *C. ichillus* from Peru, also from Iquitos, based on a specimen in the Museum of Texas Tech University. The first recording of *C. ichillus* in the wild in Peru was in the lower Urubamba region in 2013 (Gregory et al. 2015), 900 km from the museum records from Iquitos. Those authors recorded 2196 camera-trap photos and collected an adult female which was understood to be the sixth voucher specimen of the species in existence. Further recordings of a small porcupine, most likely *C. ichillus*, were made in the Maijuna-Kichwa Regional Conservation Area in Loreto, where 30 likely records of this species were recorded by camera traps (Bowler et al. 2017). A "streaked-dwarf porcupine" was recorded in Manu Biosphere Reserve during the 2015 and 2016

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dry seasons, during an arboreal camera trap survey (Whitworth et al. 2019). Live recordings have therefore been reported from four localities within Peru.

Little data exist on *C. ichillus*. Small porcupines, that is *C. ichillus* and *C. vestitus*, were recorded for the first time in western Amazonia only in 2001 (Voss and da Silva 2001). *Coendou vestitus* is known from six records in Colombia and is believed to be endemic to the Colombian Andes (Cortés-Suárez et al. 2021; Torres-Martínez et al. 2021a, 2021b). The only species of small-bodied porcupine currently known to be present in Peru is *C. ichillus*, and the IUCN range map for the species is based on only a few geographic records.

Here I report on a new distribution record of *C. ichillus*. It is the fifth geographic record of a live animal of the species in Peru and the first record for Tambopata province in the Madre de Dios region of southeastern Peru. Additionally, this is the first record from Las Piedras district, the second record from the Madre de Dios region, and the second most southerly record, with the Manu records located only slightly further south. Two other species of porcupine are present in the region: *Coendou bicolor* (Tschudi, 1844) and *Coendou longicaudatus* Daudin, 1802 (Delgado 2016; Marinho-Filho and Emmons 2016; Whitworth et al. 2016). Both of these species were recorded at the same study site as the new record of *C. ichillus* reported here (Payne et al. in prep). In the literature before 2021, including the citations mentioned here, *C. longicaudatus* is mentioned as *C. prehensilis*. Menezes et al. (2021) concluded that *C. prehensilis* is a species complex consisting of four morphotypes and three clades, with *C. prehensilis* endemic to the northern Atlantic Forest of Brazil and *C. longicaudatus* occurring in the western Amazon and Cerrado. *Coendou longicaudatus* comprises of two subspecies: *C. l. boliviensis*, which is found in the Cerrado, and *C. l. longicaudatus*, which is found in the western Amazon. Therefore, large-bodied porcupines in the Peruvian Amazon that were previously identified as *C. prehensilis* are *C. longicaudatus*.

Methods

The individual was opportunistically photographed at a small field research camp, at 12°04′18.09″S, 069°29′48.96″W, on the 44.6 km^2 Tambopata Expeditions SAC (TBX) ecotourism concession (Fig. 1). The TBX concession is located along the Las Piedras River in the Las Piedras district of Tambopata province in the Madre de Dios region of southeastern Peru. The habitat in the province is lowland Amazon rainforest. The concession features floodplain and *terra firme* forest habitats, with palm swamps (*aguajal*) and bamboo groves. The concession is surrounded primarily by concessions

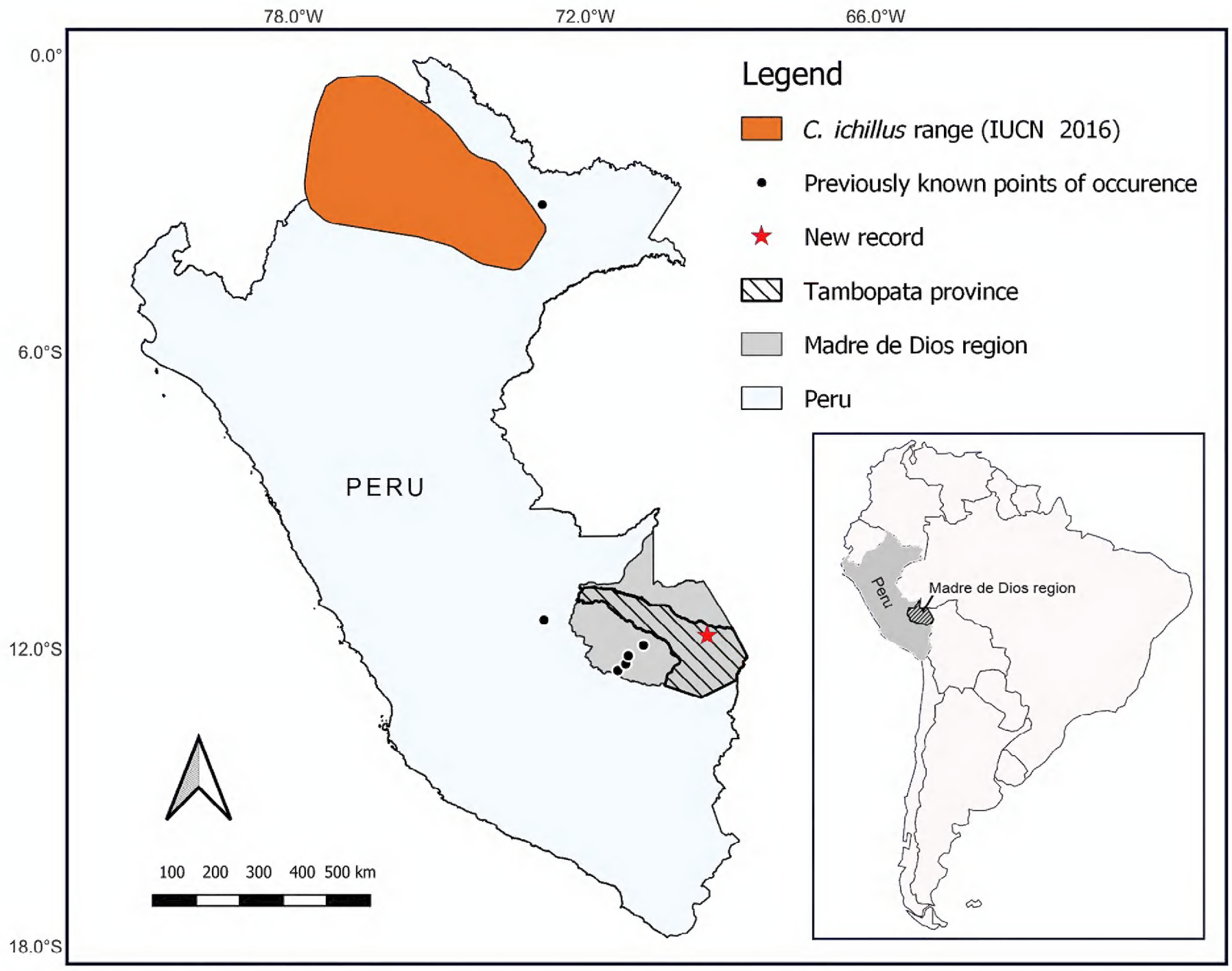

Figure 1. Map of Peru showing the IUCN (2016) range map for *Coendou ichillus* in the north. The new record, at 12°02′15″S, 073°10′16″W, can be seen within the region of Madre de Dios in southeastern Peru.

designated for the seasonal harvesting of Brazil nuts, with some timber concessions further upriver, and one small ecotourism concession immediately next door. Some of these Brazil-nut concessions in the immediate surrounding area are managed privately by conservation organisations. The Tambopata National Reserve is approximately 100 km south of the concession, and the Madre de Dios Territorial Reserve lies approximately 100 km west and upriver of the concession. The camp was located in floodplain forest approximately 800 m from the Las Piedras River and approximately 50 m from an inner forest stream. The camp had been constructed several days prior and was in use by a small team of researchers who were surveying the concession, and construction workers who were building a field station and ecotourism lodge that would later be known as the Las Piedras Amazon Center (LPAC), approximately 700 m from the camp.

The individual was spotted by construction manager Andrés Vera Reyner on 20 May 2015 at 18:43 at the field camp on the plastic ground cover of the open porch of a 4-person tent. Sunset was at 17:17. The individual was photographed at the tent (Fig. 2) and observed to leave the porch of the tent, exiting under the plastic edge of the tent which was not sealed to the porch floor; the individual walked on the ground for approximately 5 m before climbing a narrow tree in the centre of the camp kitchen which did not feature any obvious canopy bridges to other trees. The porcupine climbed high enough to be out of sight, and it was not observed returning to the ground.

Results

***Coendou ichillus* Voss & da Silva, 2001**

Figures 1, 2

New record (Fig. 1). PERU – Tambopata province • Las Piedras district, ecotourism concession leased by Tambopata Expeditions SAC; 12°04′18.09″S, 069°29′48.96″W; 215 m alt; 20.VI.2015; H. O'Donnell obs.

This new record is 376 km southeast of the Urubamba record and 242 km southeast of the Manu records, making it the second southernmost record in Peru.

Identification. The individual (Fig. 2) was identified using the description provided by the original description of the species (Voss and da Silva 2001) and Menezes et al. (2020). Notable identifying features include a long tail, which is more than three-quarters the length of the body and naked at its end; bicolored quills, which are yellow at the base; and its small body size. Additionally, I noted that Gregory et al. (2015) stated that the conspicuous difference in body size between *C. ichillus* and the two other species of porcupine present in the region, makes it less likely to misidentify *C. ichillus* as either *C. bicolor* or *C. longicaudatus*. Moreover, *C. longicaudatus* does not have yellow quills. Although the specimen was not collected, the photograph clearly shows the small-sized body (compare with a toothbrush and can of insect repellent in Fig. 1). Finally, this individual cannot be mistaken for a juvenile *C. bicolor* or *C. longicaudatus* because juveniles of these species have soft fur rather than quills.

Discussion

The behaviour and ecology of *Coendou ichillus* is little known. Arboreal habits, small body size, and nocturnal activity make the species difficult to document. Two studies have shed a little light on the species' activity patterns. Using arboreal camera traps, Tremaine (2015) recorded 2196 photos of the species, broken down into 370 events over a period of one year (Gregory et al. 2015a). Using these images, these authors examined activity patterns and found the species to be active between 1800 and 0500 h, with a peak in activity at 2000 h. A significant relationship was found to exist between the moon phase and the activity of the species, with the species less active during the full moon and most active during the moon phases which have less light: the waxing and waning crescent and the first and last quarters. Additionally, Bowler et al. (2017) recorded the species 30 times on camera traps, and all records were nocturnal. The new record reported here fits with the results of Gregory et al. (2015), in regard to the time of day and the moon phase, which was a waxing crescent moon.

Figure 2. *Coendou ichillus* in the porch of the author's tent, with tail visible. Photograph taken with an iPhone 4S on 20 May 2015 at 18:43. Note the presence of a toothbrush for scale.

Tremaine (2015) recorded *C. bicolor* using the same natural canopy bridge as *C. ichillus* on 20 occasions, a quarter of which occurred on the same night but not at the same time. Interspecific interactions were documented four times between *C. ichillus* and the night monkey *Aotus nigriceps* (Dollman, 1909) (Gregory et al. 2015a).

The geographic range of *C. ichillus* is known to overlap with the two other species of large-bodied porcupines occurring in Peru: *C. longicaudatus* and *C. bicolor*, both of which occur in the Madre de Dios region and at the study site in the Las Piedras district (Payne et al. in prep). It is possible that the species has not been recorded due to previous misidentifications as a juvenile *C. bicolor* or *C. longicaudatus*. This record has not been confirmed with a voucher specimen however the species is easily identified as a dwarf porcupine due to the small body size. When observed in the context of some form of scale, the substantial difference in body size means *C. ichillus* is easy to tell apart from *C. bicolor* (Gregory et al. 2015).

Coendou ichillus is currently listed as Data Deficient in the IUCN Red List (Weksler et al. 2016), and therefore distribution records such as the new one reported here are important in providing baseline data. I call for further studies into the distribution, taxonomy, ecological role, and conservation status of Neotropical dwarf porcupines. Arboreal camera trap surveys and live trapping for genetic testing would aid in the understanding of dwarf porcupine species and would add to the little information existing. Interviews with communities and individuals who hunt may also provide information; for example, a *C. ichillus* individual was hunted in Ecuador with a blow dart (Voss and Da Silva 2001).

This is the first published record of *C. ichillus* from Tambopata province of Peru. I hope that this paper raises awareness of the presence of this species in the Madre de Dios region, and I encourage others to review their data and publish any sightings of this species. Publishing these records will aid in understanding the distribution of this species in Peru and the greater Amazon biome. It is important to gain a greater understanding of the range and habitat use of this species, which can subsequently inform conservation management plans.

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